

Orientations of Planar Graphs

Stefan Felsner

We consider orientations of planar graphs, e.g., bipolar orientations, Schnyder woods and general alpha-orientations. To motivate their study we show some applications of these objects. Then we turn to counting problems and ask questions like: How many bipolar orientations can a planar graph on n vertices have? How many Schnyder woods of triangulations with n vertices exist? Regarding the first question we can only provide bounds but in the second case there is a closed formula and a bijective proof. Finally we exhibit a distributive lattice structure on alpha-orientations and explain some generalizations.